

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON D.C. 20544**

Spectrum Policy Task Force

Seeks Public Comment on

Issues Related to

FCC Spectrum Policies

ET Docket No. 02-135

REPLY COMMENTS OF WAYNE LONGMAN

INTRODUCTION

In reviewing the Comments responding to the Public Notice, it becomes apparent that a predisposed community of thought holds sway in this proceeding. That is, the traditional methods of spectrum management are intrinsically flawed and must be replaced by a market oriented paradigm. In reality this view is not supported by the actual evolution and success of radiocommunication to this point under “fossilized” processes. At the same time remarks by supporters of market processes readily admit that all spectrum cannot be subject to market processes. For example, market approaches contain no mechanism to satisfy desirable non-commercial services. This in itself is sufficient proof that market policies offer no systemic relief to spectrum issues which will continue in most bands and services.

The abandonment of proven processes risks the failure of future achievement. This county's spectrum policy must address the real issues of spectrum use, not postulated panaceas that have not been proven in time. The Commission should not abandon its responsibility and leave hard decisions to the market, which is, in the form of the stock market, amply demonstrating that it is unstable and unpredictable.

The Commission seeks efficiency, which should be taken to mean that new and old users should have the quickest access to the spectrum, at the lowest cost. The current allocation processes have worked exceedingly well in the past for radiocommunications, albeit a time with slower technology change, and fewer and more heavily regulated players. A measure of this shift is the change in period of ITU allocation conferences from 20 years (1959-1979) to 2-3 years after 1992. Although this speeding up is responsive to demand, it is most often accomplished the only way possible in already used spectrum, by further fragmentation. More importantly, in order for users to access new international allocations, the Commission must go through lengthy and overly complex processes to re-allocate, assign, and relocate. Market approaches are seen by some to reduce the Commission's involvement and thus delays, in selected parts of the spectrum.

The Commission creates its own licensing problems and delays when it abandons the first-come, first-served assignment principle. The comparative hearing approach may have been originally adopted to allow slow moving monopolies to catch up with entrepreneurs, but now simply creates a stumbling block for the fast delivery of service. There were no problems of delay except when the Commission wished to comparatively judge the quality of applications. Even auctions cannot compete with the speed of first-

come, first-served. Other alternatives could be sought, such as the posting of performance bonds to ensure only qualified applicants succeed in cases where there may be such doubts.

There is no guarantee that a market approach will result in a cheaper, faster, or better product for the public, or that industry will benefit (the NextWave experience). It may shorten the Commission's process, but it does not inherently speed implementation. Competition between providers can be the same if they paid the same for the spectrum, but high transaction costs associated with auctions and relocation will interfere with efficient product delivery. The Commission will still face many, if not all, of the same currently perceived problems in the future for all services, including those auctioned, and may create new ones for auctioned bands.

Having launched the auction process, special measures are needed to end it. In order not to penalize past auction winners by the grant of competitive unauctioned spectrum, new spectrum (e.g. 3G) that becomes available over say the next 10 years, could be granted free, except for rent, but only to current auction rights holders (e.g. PCS) in proportion to their auction-gained rights. They should be free to swap, not sell, it among themselves to arrange an optimum distribution. Where build-out does not occur, the spectrum should be taken away, and distributed to other parties.

Systemic improvements to the allocation, assignment and relocation matters in all bands and for all services will have far more reaching benefits than a piecemeal market approach. This will mean undoing some of the inconsistencies and barriers that have been created, some of which serve a diminishing purpose, such as compartmentalizing

spectrum management according to former monopolistic or exclusive interests (e.g. broadcasting and government).

FLEXIBILITY

The existing allocation table would be much more flexible with the elimination of government/non-government boundaries. Although the majority of spectrum is nominally shared, non-government assignments must be approved by NTIA and IRAC when they are made in shared bands. This process is not transparent, and most of this shared spectrum is not usable for ordinary commercial purposes in any case. Bringing all spectrum management into a unified regime would create greater responsiveness and flexibility. Importantly, it would enable a single management body, with no inherent government or non-government bias, access to the entire spectrum when it seeks to rebalance the needs of all parties.

More flexibility will not be gained if secondary markets independently re-deploy spectrum according to different, narrow and local interests. On the contrary, the smaller and smaller fragments that would remain are of less use to everyone. Every new allocation further fragments the spectrum. Already, UWB and 3G obsolescence can be foreseen in the regime of networked radios proposed by David P. Reed in his Comment. This will likely have a wholly new demand on the spectrum, and require assembly of a new package of frequencies, which is much more difficult in a fragmented environment. Annex 1 contains discussion of a broader flexible allocations approach.

UNLICENSED DEVICES

Part 15 devices should be converted to secondary services. Secondary status involves licensing which involves a responsibility and capability to resolve interference to primary services and other secondary uses. Greater care is needed with terminology: secondary services are underlay services to primary services; additional shared primary services are overlays to existing primary services. Indeed, an additional secondary service is an overlay to an existing secondary service.

Although Part 15 devices are intended to avoid interference, proximity and aggregation can result in interference to licensed or unlicensed devices. Requiring manufacturers to have a blanket secondary license for each model of (unlicensed) device would place resolution of interference, including aggregate interference, on their shoulders, and make them take extra effort to avoid it. Consumers should not be required to avoid or resolve interference. Nor should they be left on their own when electromagnetic incompatibility causes their devices to malfunction.

Unlicensed devices posing a significant aggregate interference hazard should be allocated their own band. Perhaps in the long term, location-aware networked devices could access a central database and self-assign interference free frequencies.

SPECTRUM RENT

A substantial annual charge for all spectrum uses would have immediate application and benefits. It would encourage a less polluted and congested spectrum. Imagine the pollution of the ecosphere, and the crowding of highways if gasoline were free. No user, including governments, should have free access to spectrum for the same

reason - free access means there is no ownership of the problems arising from it. The same applies to Part 15 devices.

Rent would also provide public revenue that reflects the current and true value of the entire spectrum; unlike auctions, secondary markets, or license fees.

The spectrum rent for commercial users should be a non-regressive, flat tax on revenue. This would avoid the auction's depletion of capital, reflect the true value of the system using the spectrum, and should not materially affect profitability. The amount should be high enough to encourage cancellation of licenses for marginally beneficial systems, but not so high as to appreciably affect the cost of service - perhaps 1% of gross revenue. The amount deserves further study, but it should be the same for all users in all parts of the spectrum, since spectrum is interchangeable over wide ranges of frequencies.

For non-revenue systems, rent might be that of equivalent revenue systems, or if none, based on the capital cost of the radio installation. It may be assumed that the straight-line annual depreciation of capital is a direct measure of the annual value to the owner, as he would have spent more or less if needed to obtain a different match of features and needs. The annual depreciation would substitute for gross revenue as the basis for rent. The length of the amortization period should be fixed for each type of system. Such a process would also help identify fully amortized systems for possible relocation or replacement

Spectrum rent could be based on occupied bandwidth, which would encourage users to use more efficient equipment; however, this would distort the spectrum value equation. Based on revenue only, rent will indicate the relative worth of different bands. If too little rent is collected in a band, this will justify reallocation, reducing its size, or

adding more uses to it. It should also discourage overly long amortization periods. Excessive bandwidth penalty payments would be unjust to those systems which are unable to make improvement. Penalties could also be regarded as purchased inefficiency, which could perpetuate the inefficiency.

Government, non-profit, educational and any other user should be charged, just as they pay for paper or any other input. At the federal government level, since it is from one pocket to another, a revolving fund could cover annual rent of existing spectrum use. Increases for additional spectrum use could come from ordinary agency budgets, while decreases should stay in agency budgets as a reward for efficient spectrum use. Rents from other levels of government may require forgivable debts unless wider revolving funds can be established.

Unlicensed device rent should be charged to the manufacturer based on the wholesale price of the device. Amateur radio operators should also be charged, but the debt forgiven, as a reward for advancing the art. The purpose of Amateur billing is to track the level of activity in that spectrum as well.

A spectrum rent is also a powerful incentive for all parties to maintain a comprehensive and accurate public database of frequency assignments, which is not available now. This data is indispensable for growth and compatibility studies, interference resolution, spectrum planning and making new frequency assignments. Many of the Commission's problems in dealing with spectrum may be rooted in this fact.

REGULATORY CONSISTENCY

A uniform set of spectrum and licensing policies facilitates fairness, predictability and change. Users should not be driven to or barred from any part of the spectrum because of administrative divisions. All users should have equality before the Commission and thus equality before the law, derived from fundamentally identical regulations and equal opportunity to access spectrum, whatever the depth of their pockets. The same regimes should apply to government and non-government users. Regulatory consistency will also make narrow political influence less likely.

Spectrum policy should not be driven by ideology as the subject is already complex enough. Radio regulation should be the immediate and practical solution of exigencies arising from the science and opportunities of radio rather than the satisfaction of political, economic or moral philosophies. Spectrum managers require simplification and better control, not less or more, to keep the spectrum up to date.

Most of the faults found with spectrum management today are the result of non-technical choices in the past such as government/non-government division of spectrum, and special-interest inspired allocation, licensing and relocation policies. Eliminating or minimizing these non-technical matters will enable technically and economically sound adjudication and solution of most of the perceived problems.

The imposition of extraneous non-technical issues to the provision of wireless technology trivializes the genius of generations of engineers, scientists, experimenters and entrepreneurs who have brought us the magic of radiocommunication for the last 100 years. The Commission should not relegate these great works to those who have contributed little to the science. If the spectrum is in trouble, such approaches will only make it much worse. History will keenly judge the wisdom, or lack thereof, of those who determine the legacy of future generations. This is not an experiment.

Dated this 18th day of July, 2002

/s/

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FLEXIBLE ALLOCATIONS

In my Comment, I described a mechanism wherein band boundaries, within limits, could move to take into account the actual demand in bands adjacent to each other. Based on frequency agile equipment, such as frequency synthesized radios which are becoming common, assignments would be first made in the center of the band so as not to constrict band edge movement, and gradually move, if required, to stay within the dynamic width of the allocation. Although this is an idealistic solution which would take a long time to implement across the spectrum, it is further described here to round out the concept.

To increase flexible use, the definition (or identification) by service or user is replaced by the identification of the characteristics of spectrum use (spectrum profile). This quantitative identification is highly technical: emission type, bandwidth, and power¹. It would hold little attraction for most, but it is studiously disregards the type of user or type of radio system. Because of this “anonymity” a new equipment, service, or user could be introduced into any band with the same or a compatible spectrum profile. A new profile can be considered compatible if it has essentially the same interference protection characteristics as the original profile. Such a new profile could be added to the band definition. If the system is incompatible it can still be added to the band definition, just as shared services in existing allocations are not always compatible, with additional rules for their use. A new system would not be added into a band if the growth capacity,

¹ This will vary somewhat, by usage

as demonstrated by actual use, is required by the original use(s), unless the regulator decided to act otherwise.

Allocation activity would become largely a technical issue, which should speed change. The same technical regulatory rules as now can continue to apply, since they are derived in part from the profile characteristics of existing systems. It keeps the essence of the original technical studies of an allocation in place, something that is usually lost once a conventional allocation is made to the current qualitatively defined services (e.g. mobile).

The creation of flexible bands in some parts of the spectrum should be simple, based on the spectrum profile of existing assignments. The new band would be roughly centered on the existing assignments, and dimensioned depending on actual growth. This could give an immediate benefit in some areas, where adjacent bands are suffering spectrum shortage. This may not give relief in fully congested areas, but nothing else will, short of removing some users from the spectrum. However, since more spectrum should become available, and access is granted by compatibility, even congested areas should benefit.

The need for spectrum certainty would be established by first finding or allocating a block that will satisfy the perceived growth requirement. Beyond that first action, the actual use will determine the actual width of the band. There will be less of a guarantee of future spectrum for those users who have more than they need in the current blocks, but there should be more of a guarantee that the overall demand on the spectrum will be satisfied.

New technologies can be introduced in the white space between groups of assignments. A new use can be introduced into an existing band by phasing existing systems into smaller and smaller segments.

The identification of bands by spectrum profile and flexible band boundaries increase the alternative uses of a band, give access to more spectrum to all users, and can accurately adjust to local demand. The lessening of user group identification should also reduce their competition and increase their cooperation for spectrum solutions.